

MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for September, 1899, is based on reports from about 3,024 stations furnished by paid and voluntary observers, classified as follows: regular stations of the Weather Bureau, 170; West Indian service stations, 10; cotton region stations, 127; corn and wheat region stations, 133; special river stations, 132; special rainfall stations, 48; voluntary observers of the Weather Bureau, 2,238; Army post hospital reports, 27; United States Life-Saving Service, 14; Southern Pacific Railway Company, 96; Canadian Meteorological Service, 32; Mexican Telegraphic Service, 20; Mexican voluntary stations, 7. International simultaneous observations are received from a few stations and used, together with trustworthy newspaper extracts and special reports.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Meteorologist to the Hawaiian Government Survey, Honolulu; Senor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Señor A. M. Chaves, Director-General of Mexican Telegraphs; Mr. Maxwell Hall,

Government Meteorologist, Kingston, Jamaica; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; and Capt. J. E. Craig, Hydrographer, United States Navy.

The REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local meridian is mentioned.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

During the last two days of August, 1899, a West Indian disturbance of moderate strength moved from the vicinity of Dominica and Martinique west-northwest toward the Island of Santo Domingo and on the morning of September 1 was apparently central near Port au Prince, Haiti. During September 1 and 2 the center of this disturbance recurved northward over Haiti, and moving thence northeastward passed near the Bermuda Islands during the 4th.

On the morning of the 8th a storm of pronounced energy appeared east of the Island of St. Kitts, from which position it moved northwestward until the 10th, when it began to re-curve to the northward. During the 11th and 12th the re-curve changed to the northwestward and the storm passed over the Bermuda Islands during the night of the 12-13th. This storm was quite severe over the more eastern islands of the Leeward group of the Lesser Antilles during the evening and night of the 8th, and also over the Bermuda Islands during the night of the 12th.

The action taken by the Weather Bureau in giving warning of the tropical storms above referred to is indicated in the more detailed descriptions of the storms which follow.

The most important storm of the month in the Lake region occurred on the 24th when wind velocities of 40 to 50 miles an hour were reported at a number of lake stations. A second storm of notable strength crossed the Great Lakes during the night of the 27th and the day of the 28th. The

advice and warnings issued in connection with these storms were ample and timely.

The first killing frost of the season occurred in the Dakotas, western Minnesota, and Wyoming on the morning of the 28th, in Nebraska, northern Kansas, eastern Minnesota, western Wisconsin, and Iowa on the morning of the 29th, with light frost as far south as northern Arkansas, and on the morning of the 30th killing frost was reported generally in the Lake region and the middle and lower Ohio Valley, heavy frost was noted at Memphis, and light frost in central and eastern parts of Tennessee. Ample warnings were issued in connection with the frosts referred to.

In the Pacific coast districts the weather of the month was not marked by specially notable features.

THE WEST INDIAN DISTURBANCE OF AUGUST 29-SEPTEMBER 4, 1899.

This disturbance was of moderate strength throughout a course which lay from a point east of Guadaloupe to a position south of Santo Domingo from the 29th to the 31st of August, thence northwest and north over western Haiti, and thence northeastward to the vicinity of the Bermuda Islands by September 4. Shipping and other interests were advised of the approach and character of this disturbance and pre-